

CLAIMS

We Claim:

1. A catheter for delivering a therapeutic agent to a selected site within an organism comprising, in combination:

a tubular section having a solid section and a microporous membrane section.
2. The catheter as recited in claim 1, wherein the microporous membrane section further comprises, a first end and a second end, the first end and second end coupled to the solid section forming a continuous cross section of the tubular section.
3. The catheter as recited in claim 1, wherein the solid tubular section comprises a radio opaque material.
4. A catheter for delivering a therapeutic agent to a selected site within an organism comprising, in combination:

a tubular section having a solid section and a diffusion area, and an outer tubular wall and an inner tubular wall, the outer tubular wall having at least one opening through to the inner tubular wall, the inner tubular wall lined with a microporous membrane.
5. The catheter as recited in claim 4, wherein the microporous membrane is located in the diffusion areas.
6. The catheter as recited in claim 4, wherein the microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.

7. The catheter as recited in claim 5, wherein the microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
8. The catheter as recited in claim 4, wherein the solid tubular section comprises a radio opaque material.
9. A catheter for delivering a therapeutic agent to selected sites within an organism comprising, in combination:
 - a distal end and a proximal end, the distal end having a closed end; and
 - a tubular section having a solid section and at least two diffusion sections, the diffusion sections longitudinally aligned from the distal end corresponding to the selected sites.
10. The catheter as recited in claim 9, wherein the diffusion sections are microporous membrane sections.
11. The catheter as recited in claim 10, wherein the diffusion sections further comprise, a first end and a second end, the first end and second end coupled to the solid section forming a continuous cross section of the tubular section.
12. The catheter as recited in claim 9, wherein the solid tubular section comprises a radio opaque material.
13. The catheter as recited in claim 9, wherein the tubular section further comprises, an outer tubular wall and an inner tubular wall, the outer tubular wall having at least one opening within the diffusion sections through to the inner tubular wall, the inner tubular wall lined with a microporous membrane.

14. The catheter as recited in claim 13, wherein the microporous membrane is located at the diffusion sections.
15. The catheter as recited in claim 13, wherein the microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
16. The catheter as recited in claim 14, wherein the microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
17. A system for delivering a therapeutic agent to selected sites within an organism, comprising:
 - a pump;
 - at least two catheters each comprising a tubular section having a solid section and a microporous membrane section; and
 - a manifold having an entrance end and exit opening, the exit opening connected to the proximal end of the at least two catheters and the entrance end coupled to the pump.
18. The system as recited in claim 17, wherein the catheter microporous membrane section further comprises, a first end and a second end, the first end and second end coupled to the solid section forming a continuous cross section of the tubular section.
19. The system as recited in claim 17, wherein the catheter solid tubular section comprises a radio opaque material.
20. The system as recited in claim 17, wherein the pump is an implantable pump.
21. The system as recited in claim 17, wherein the pump is an external pump.

22. A system for delivering a therapeutic agent to a selected site within an organism, comprising:
 - a pump; and
 - a catheter connected to the pump comprising a tubular section having a solid section and a microporous membrane section.
23. The system as recited in claim 22, wherein the catheter microporous membrane section further comprises, a first end and a second end, the first end and second end coupled to the solid section forming a continuous cross section of the tubular section.
24. The system as recited in claim 22, wherein the catheter solid tubular section comprises a radio opaque material.
25. The system as recited in claim 22, wherein the pump is an implantable pump.
26. The system as recited in claim 22, wherein the pump is an external pump.
27. A system for delivering a therapeutic agent to selected sites within an organism, comprising:
 - a pump;
 - at least two catheters each having a distal end and proximal end, the distal end having a closed end, and a tubular section having a solid section and at least two diffusion sections, the diffusion sections longitudinally aligned from the distal end corresponding to the selected sites; and
 - a manifold having an entrance end and exit opening, the exit opening connected to the proximal end of the at least two catheters and the entrance end coupled to the pump.

28. The system as recited in claim 27, wherein the catheter diffusion sections are microporous membrane sections.
29. The system as recited in claim 28, wherein the catheter diffusion sections further comprise, a first end and a second end, the first end and second end coupled to the solid section forming a continuous cross section of the tubular section.
30. The system as recited in claim 27, wherein the catheter solid tubular section comprises a radio opaque material.
31. The system as recited in claim 27, wherein the catheter tubular section further comprises, an outer tubular wall and an inner tubular wall, the outer tubular wall having at least one opening within the diffusion sections though to the inner tubular wall, the inner tubular wall lined with a microporous membrane.
32. The system as recited in claim 31, wherein the catheter microporous membrane is located at the diffusion sections.
33. The system as recited in claim 31, wherein the catheter microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
34. The system as recited in claim 32, wherein the catheter microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
35. The system as recited in claim 27, wherein the pump is an implantable pump.
36. The system as recited in claim 27, wherein the pump is an external pump.

37. A system for delivering a therapeutic agent to a selected site within an organism, comprising:

a pump; and

a catheter connected to the pump, the catheter comprising a tubular section having a solid section and a diffusion area, and an outer tubular wall and an inner tubular wall, the outer tubular wall having at least one opening through to the inner tubular wall, the inner tubular wall lined with a microporous membrane.

38. The system as recited in claim 37, wherein the catheter solid tubular section comprises a radio opaque material.

39. The system as recited in claim 37, wherein the catheter microporous membrane is located in the diffusion area.

40. The system as recited in claim 37, wherein the catheter microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.

41. The system as recited in claim 39, wherein the catheter microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.

42. The system as recited in claim 37, wherein the pump is an implantable pump.

43. The system as recited in claim 37, wherein the pump is an external pump.

44. A system for delivering a therapeutic agent to selected sites within an organism, comprising:

a pump;

at least two catheters each catheter comprising a tubular section having a solid section and a diffusion area, and an outer tubular wall and an inner tubular wall, the outer tubular wall having at least one opening through to the inner tubular wall, the inner tubular wall lined with a microporous membrane; and

a manifold having an entrance end and exit opening, the exit opening connected to the proximal end of the at least two catheters and the entrance end coupled to the pump.

45. The system as recited in claim 44, wherein the catheter solid tubular section comprises a radio opaque material.
46. The system as recited in claim 44, wherein the catheter microporous membrane is located at the diffusion area.
47. The system as recited in claim 44, wherein the catheter microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
48. The system as recited in claim 46, wherein catheter the microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
49. The system as recited in claim 44, wherein the pump is an implantable pump.
50. The system as recited in claim 44, wherein the pump is an external pump.
51. A system for delivering a therapeutic agent to selected sites within an organism, comprising:
a pump; and

a catheter connected to the pump having a distal end and proximal end, the distal end having a closed end, and a tubular section having a solid section and at least two diffusion sections, the diffusion sections longitudinally aligned from the distal end corresponding to the selected sites.

52. The system as recited in claim 51, wherein the catheter diffusion sections are microporous membrane sections.
53. The system as recited in claim 52, wherein the catheter diffusion sections further comprise, a first end and a second end, the first end and second end coupled to the solid section forming a continuous cross section of the tubular section.
54. The system as recited in claim 51, wherein the catheter solid tubular section comprises a radio opaque material.
55. The system as recited in claim 51, wherein the catheter tubular section further comprises, an outer tubular wall and an inner tubular wall, the outer tubular wall having at least one opening within the diffusion sections through to the inner tubular wall, the inner tubular wall lined with a microporous membrane.
56. The system as recited in claim 55, wherein the catheter microporous membrane is located at the diffusion sections.
57. The system as recited in claim 55, wherein the catheter microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.
58. The system as recited in claim 56, wherein catheter the microporous membrane further comprises, an outer area and an inner area, the outer area having an interference fit with the inner tubular wall.

59. The system as recited in claim 51, wherein the pump is an implantable pump.
60. The system as recited in claim 51, wherein the pump is an external pump.